Study finds AI can speed design of health software

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Artificial intelligence helped clinicians to accelerate the design of diabetes prevention software, a new study finds. Publishing in the *Journal of Medical Internet Research*, the study examined the capabilities

of a form of artificial intelligence (AI) called generative AI or GenAI, which predicts likely options for the next word in any sentence based on how billions of people used words in context on the internet.

A side effect of this next-word prediction is that the generative AI "chatbots" like chatGPT can generate replies to questions in realistic language, and produce clear summaries of complex texts.

Led by researchers at NYU Langone Health, the current paper explores the application of ChatGPT to the design of a software program that uses text messages to counter diabetes by encouraging patients to eat healthier and get exercise.

The team tested whether AI-enabled interchanges between doctors and software engineers could hasten the development of such a personalized automatic messaging system (PAMS).

In the current study, eleven evaluators in fields ranging from medicine to computer science successfully used ChatGPT to produce a version of the diabetes tool over 40 hours, where an original, non-AI-enabled effort had required more than 200 programmer hours.

"We found that ChatGPT improves communications between technical and non-technical team members to hasten the design of computational solutions to medical problems," says study corresponding author Danissa Rodriguez, Ph.D., assistant professor in the Department of Population Health at NYU Langone, and member of its Healthcare Innovation Bridging Research, Informatics and Design (HiBRID) Lab.

"The chatbot drove rapid progress throughout the software development life cycle, from capturing original ideas, to deciding which features to include, to generating the computer code. If this proves to be effective at scale it could revolutionize health care software design."

AI as translator

Generative AI tools are sensitive, say the study authors, and asking a question of the tool in two subtly different ways may yield divergent answers. The skill required to frame the questions asked of chatbots in a way that elicits the desired response, called prompt engineering, combines intuition and experimentation. Physicians and nurses, with their understanding of nuanced medical contexts, are well positioned to engineer strategic prompts that improve communications with engineers, and without learning to write computer code.

These design efforts, however, where care providers, the would-be users of a new software, seek to advise engineers about what it must include can be compromised by attempts to converse using "different" technical languages.

In the current study, the clinical members of the team were able to type their ideas in plain English, enter them into chatGPT, and ask the tool to convert their input into the kind of language required to guide coding work by the team's software engineers. AI could take software design only so far before human software developers were needed for final code generation, but the overall process was greatly accelerated, say the authors.

"Our study found that chatGPT can democratize the design of health care software by enabling doctors and nurses to drive its creation," says senior study author Devin Mann, MD, director of the HiBRID Lab, and strategic director of Digital Health Innovation within NYU Langone Medical Center Information Technology (MCIT).

"GenAI-assisted development promises to deliver computational tools that are usable, reliable, and in-line with the highest coding standards."

More information: Leveraging Generative AI Tools to Support the Development of Digital Solutions in Health Care Research: Case Study, *Journal of Medical Internet Research* (2024).

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